

**CLAIMS**

What is claimed is:

1. A method for operating a software agent, comprising steps of:

initiating a search for other software agents;

querying a current directory service agent for a list of other software agents that match at least one search criterion;

adding any new matching software agents to a list of matching software agents;  
and

selectively one of terminating the search or selecting, from a previously constructed list of directory service agents, another directory service agent as the current directory service agent, and repeating the steps of querying and adding.

2. A method for operating a software agent, comprising steps of:

initiating a search for directory service agents;

querying a current directory service agent for a list of other directory service agents;

adding any new directory service agents to a list of directory service agents; and

selectively one of terminating the search or selecting another directory service agent as the current directory service agent, and repeating the steps of querying and adding.

3. A method for operating a software agent, comprising steps of:

initiating a search procedure;

determining whether to query a current directory service agent for a list of other software agents that match at least one search criterion;

09717856 112100

if it is determined to query the current directory service agent, querying the current directory service agent for the list of other software agents that match at least one search criterion;

adding any new matching software agents to a list of matching software agents;

determining whether to query the current directory service agent for a list of other directory service agents;

if it is determined to query the current directory service agent, querying the current directory service agent for the list of other directory service agents;

adding any new directory service agents to a list of directory service agents; and

selectively one of terminating the search procedure or selecting from the list of directory service agents another directory service agent as the current directory service agent, and repeating the steps of determining, querying and adding.

4. A method as in claim 3, wherein if it is determined not to query the current directory service agent for the list of other software agents, the method instead executes the step of determining whether to query the current directory service agent for the list of other directory service agents.

5. A method as in claim 3, wherein if it is determined not to query the current directory service agent for the list of other directory service agents, the method instead executes the step of selectively one of terminating the search procedure or selecting from the list of directory service agents another directory service agent as the current directory service agent.

6. A method as in claim 3, wherein the step of determining whether to query a current directory service agent for a list of other software agents considers at least one of a current content of the list of matching software agents, on information concerning the current directory service agent, on resources so far expended on the search, and on available resources.

7. A method as in claim 3, wherein the step of determining whether to query a current directory service agent for a list of other directory service agents considers at least one of a current content of the list of matching software agents, characteristics of

09717856.112100

the entries in the list of matching software agents, on resources so far expended on the search, on available resources, and on a number of directory service agents that have already been queried.

8. A method as in claim 3, wherein the step of querying the current directory service agent for the list of other software agents comprises an initial step of attempting to negotiate acceptable terms with the current directory service.

9. A method as in claim 3, wherein the step of querying the current directory service agent for the list of other directory service agents comprises an initial step of attempting to negotiate acceptable terms with the current directory service.

10. A method as in claim 3, wherein the step of initiating the search procedure comprises steps of initializing the list of directory service agents with default information and clearing the list of matching software agents, and selecting the current directory service agent from the initialized list of directory service agents.

11. A method as in claim 3, wherein the software agent comprises a directory service agent, wherein the step of initiating the search procedure comprises steps of initializing the list of directory service agents and the list of matching software agents with information maintained by the directory service agent, and selecting the current directory service agent from the initialized list of directory service agents.

12. A method as in claim 3, wherein there are a plurality of directory service agents, and wherein a first directory service agent contacts a second directory service agent with a request to list the first directory service agent, the request comprising listing information.

13. A method as in claim 3, wherein there are a plurality of directory service agents, and wherein a first directory service agent contacts a second directory service agent with a solicitation to list the second directory service agent, and wherein the second directory service agent accepts or refuses the solicitation, and where an acceptance comprises listing information.

14. A method as in claim 3, wherein there are a plurality of directory service agents, and wherein a first directory service agent indirectly contacts a second directory service agent, via a third directory service agent, with a request to list the first directory

09717856 112100

service agent.

15. A method as in claim 3, wherein there are a plurality of directory service agents, and wherein a first directory service agent indirectly contacts a second directory service agent, via a third directory service agent, with a solicitation to list the second directory service agent.

16. A data communications system comprising a communications network that couples together processor nodes certain ones of which execute a program for implementing the functionality of at least one of a software agent or a directory service agent, wherein the program operates so as to initiate a search procedure for at least one of other software agents or directory service agents, to determine whether to query a current directory service agent for a list of other software agents that match at least one search criterion, and responsive to determining to query the current directory service agent, to query the current directory service agent for the list of other software agents that match at least one search criterion, to add any new matching software agents to a list of matching software agents, to determine whether to query a current directory service agent for a list of other directory service agents, responsive to determining to query the current directory service agent for a list of other directory service agents, to query the current directory service agent for the list of other directory service agents, to add any new directory service agents to a list of directory service agents and to selectively one of terminate the search procedure or to select from the list of directory service agents another directory service agent as the current directory service agent, and to continue this process until the search procedure is terminated.

17. A system as in claim 16, wherein the program, when determining whether to query a current directory service agent for a list of other software agents, considers at least one of a current content of the list of matching software agents, on information concerning the current directory service agent, on resources so far expended on the search, and on available resources.

18. A system as in claim 16, wherein the program, when determining whether to query a current directory service agent for a list of other directory service agents, considers at least one of a current content of the list of matching software agents, characteristics of the entries in the list of matching software agents, on resources so far expended on the search, on available resources, and on a number of directory service agents that have already been queried.

09717856-112100

19. A system as in claim 16, wherein the program, when querying the current directory service agent for the list of other software agents, attempts to negotiate acceptable terms with the current directory service.

20. A system as in claim 16, wherein the program, when querying the current directory service agent for the list of other directory service agents, attempts to negotiate acceptable terms with the current directory service.

21. A system as in claim 16, wherein the program, when initiating the search procedure, initializes list of directory service agents with default information, clears the list of matching software agents and selects the current directory service agent from the initialized list of directory service agents.

22. A system as in claim 16, wherein the program implements a directory service agent and, when initiating the search procedure, initializes the list of directory service agents and the list of matching software agents with information maintained by the directory service agent, and selects the current directory service agent from the initialized list of directory service agents.

23. A system as in claim 16, wherein there are a plurality of directory service agents, and wherein a first directory service agent contacts, through said communications network, a second directory service agent with a request to list the first directory service agent, the request comprising listing information.

24. A system as in claim 16, wherein there are a plurality of directory service agents, and wherein a first directory service agent contacts, through said communications network, a second directory service agent with a solicitation to list the second directory service agent, and wherein the second directory service agent accepts or refuses the solicitation, and where an acceptance comprises listing information.

25. A system as in claim 16, wherein there are a plurality of directory service agents, and wherein a first directory service agent indirectly contacts, through said communications network, a second directory service agent, via a third directory service agent, with a request to list the first directory service agent.

26. A system as in claim 16, wherein there are a plurality of directory service agents, and wherein a first directory service agent indirectly contacts, through said

09717856 112100

communications network, a second directory service agent, via a third directory service agent, with a solicitation to list the second directory service agent.

09717856 112100